What is claimed is:

3   1.   A method of scheduling data packet transmission in a data communication

4   network, comprising:

5   computing an arrival time for first data packet relative to a system clock value and

6   an arrival time for a second data packet relative to the system clock value, wherein the

7   system clock value returns to zero after reaching a maximum value;

8   determining a maximum range of arrival times for the first and second data

9   packets; and

10   determining which arrival time will occur earliest by determining whether a

11   difference between the arrival times for the first and second data packets exceeds the

12   maximum range.

1   2.   The method according to claim 1, wherein said data packet arrival times are based

2   on a start of reception time, a data packet length and transmission speed.

1   3.   The method according to claim 1, wherein a lower one of the arrival times occurs

2   earliest when the difference between the arrival times for the first and second data

3   packets does not exceed the maximum range.

1   4.   The method according to claim 1, wherein a higher one of the arrival times occurs

2   earliest when the difference between the arrival times for the first and second data

3   packets exceeds the maximum range.

1   5.   The method according to claim 1, further comprising arranging scheduling values

2   for the data packets in a scheduling heap data structure.

1   6.   The method according to claim 1, further comprising prioritizing the data packets

2   according to their arrival times.

1   7.   A method of scheduling data packet transmission in a data communication

2   network, comprising:

3   inserting scheduling values for received data packets into a scheduling heap data

4   structure;

5   arranging the scheduling values according to assigned priority levels; and

6   arranging scheduling values for selected data packets based on anticipated arrival

7   times for the data packets.

1   8.   The method according to claim 7, wherein the scheduling values for the selected

2   data packets are arranged using weighted fair queuing.

1   9.   The method according to claim 8, wherein the scheduling values for the selected

2   data packets include a priority value equal to that of a priority value of another data

3   packet.

1   10.   The method according to claim 8, wherein the scheduling values for the selected

2   data packets lack a priority value.

1   11.   A system for scheduling data packet transmission in a data communication

2   network, comprising:

3   a scheduling heap data structure having a plurality of levels for storing scheduling

4   values for data packets according to their relative priorities; and

5   a queue controller coupled to the data structure for manipulating scheduling

6   values in the heap data structure, the queue controller including an apparatus for

7   comparing anticipated arrival times for data packets including a first memory register for

8   storing a first arrival time, a second memory register for storing a second arrival time,

9   and logic for performing 2's complement subtraction on the first and second arrival

10   times, wherein a carry output of indicates which of the first and second arrival times

11   occurs earliest according to whether a difference between the first and second arrival

12   times exceeds a range of arrival times.

1 12.   The system according to claim 11, wherein said data packet arrival times are

2   based on a start of reception time, a data packet length and transmission speed.

1 13.   The system according to claim 11, further comprising arranging scheduling values

2   for the data packets in a scheduling heap data structure.

1 14.   The system according to claim 11, further comprising prioritizing the data packets

2   according to their arrival times.